What is claimed is:

1. A method for stably associating a polyelectrolyte layer with a substrate surface, said method comprising:

(a) producing a polyelectrolyte layer on at least one surface of a substrate;

(b) contacting said polyelectrolyte layer with a bifunctional molecule comprising:

(i) a first moiety that stably associates with said polyelectrolyte layer, and

(ii) a second moiety that stably associates with said substrate surface;

wherein said contacting occurs under conditions sufficient to stably associate said polyectrolyte layer to said substrate surface.

2. The method of claim 1, wherein said polyelectrolyte comprises a polycationic material.

3. The method of claim 2, wherein said polycationic material comprises a polyamine.

4. The method of claim 3, wherein said polyamine comprises poly(L-lysine).

5. The method of claim 1, wherein said first moiety comprises a functional group that covalently bonds to a polycationic material.

6. The method of claim 5, wherein said first moiety comprises an anhydride.

7. The method of claim 1, wherein said substrate surface comprises a material selected from the group of glass, metal oxide, metal or polymeric material.

8. The method of claim 7, wherein said substrate surface comprises a glass.

9. The method of claim 1, wherein said second moiety comprises a functional group that covalently bonds to a glass substrate surface.

10. The method of claim 9, wherein said second moiety comprises a silanating functional group.

11. The method of claim 10, wherein said second moiety comprises a trialkoxysilyl group.

12. A method for covalently bonding a polyelectrolyte layer to a substrate surface, comprising:

(a) providing a substrate having a polyelectrolyte layer deposited on said surface thereof;

(b) contacting said polyelectrolyte layer and said substrate surface with an agent having a passivating group capable of covalently bonding to said polyelectrolyte layer and an anchoring group capable of covalently bonding to said substrate surface; and

(c) subjecting said substrate surface and said polyelectrolyte layer to a condition(s) that causes said passivating group to covalently bond to said polyelectrolyte layer and said anchoring group to covalently bond to said substrate surface.

13. The method of claim 12, wherein said polyelectrolyte comprises a polycationic material.

14. The method of claim 12, wherein said substrate surface comprises a material selected from the group of glass, metal oxide, metal or polymeric material.

15. The method of claim 12, wherein said anchoring group comprises a silanating functional group.

16. The method of claim 12, wherein said condition comprises heating said substrate.

17. A method for fabricating a microarray, said method comprising:

(a) producing a polyelectrolyte layer on at least one surface of a substrate;

(b) depositing a plurality of spots of ligands on said polyelectrolyte layer, said ligand spots arranged in an array pattern;

(c) contacting said polyelectrolyte layer with a reagent comprising:

(i) a passivating moiety that reacts with said polyelectrolyte layer, and

(ii) a substrate reactive functionality; and

(d) producing a covalent bond between said substrate reactive functionality and said substrate.

18. The method of claim 17, further comprising cross-linking said ligand spots onto said polyelectrolyte layer.

19. The method of claim 18, wherein said ligands comprise nucleic acids.

20. A method for fabricating a microarray, said method comprising:

(a) producing a polyamine layer on at least one silica surface of a substrate;

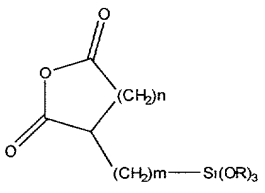
(b) depositing a plurality of spots of ligands on said polyamine layer, said ligand spots arranged in an array pattern;

(c) contacting said polyamine layer with a solution of a trialkoxysilyl anhydride; and

(d) forming a covalent bond between said anhydride and said polyamine layer and a covalent silicon-oxygen bond between said trialkoxysilyl propyl anhydride and said silica surface on said substrate.

21. The method of claim 20, wherein said polyamine comprises poly(L-lysine).

22. The method of claim 20, wherein said trialkoxysilyl anhydride comprises a compound having the structure:



wherein n is either zero or an integer from 1 to 10, m is either zero or an integer from 1 to 10, and R is an alkyl or functionally terminated alkenyl group.

23. The method of claim 22, wherein n is an integer equal to 1 or 2, and m is either zero or an integer from 1 to 4.

24. The method of claim 20, wherein said trialkoxysilyl anhydride comprises 3-(triethoxysilyl)propyl-succinic anhydride.

25. The method of claim 20, further comprising cross-linking said ligand spots onto said polyamine layer.

26. The method of claim 20, wherein said ligands comprise nucleic acids.

27. The array produced according to the method of Claim 20.

28. A microarray comprising:

(a) a polyelectrolyte layer stably associated with a substrate surface; and

(b) a plurality of ligand spots on said polyelectrolyte layer.

29. The array of claim 28, wherein said polyelectrolyte comprises a polycationic material.

30. The array of claim 28, wherein said substrate surface comprises a material selected from the group of glass, metal oxide, metal or polymeric material.

31. The array of claim 28, wherein said polyelectrolyte layer is covalently bonded to said substrate layer.

32. The array of claim 28, wherein said ligand spots comprise nucleic acid spots.

33. In a method of performing an assay employing a microarray, the improvement comprising:

employing an array according to Claim 28.

34. A method of detecting the presence of an analyte in a sample, said method comprising:

contacting (a) a polymeric array according to claim 28 having a polymeric ligand that specifically binds to said analyte, with (b) a sample suspected of comprising said analyte under conditions sufficient for binding of said analyte to a polymeric ligand on said array to occur; and

detecting the presence of binding complexes on the surface of the said array; whereby the presence of said analyte in said sample is detected.

35. The method according to Claim 34, wherein said polymer is a nucleic acid.

36. The method according to Claim 35, wherein said analyte is a nucleic acid and said binding is by hybridization.

37. The method according to Claim 34, wherein said method further comprises a data transmission step.

38. A kit for use in an assay that employs an array, said kit comprising:
an array according to claim 28; and
instructions for using said array in a hybridization assay.

39. The kit of claim 38, wherein said kit further comprises reagents for generating a labeled target nucleic acid sample.

40. The kit of claim 34, wherein said kit further comprises a hybridization buffer.